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ABSTRACT

This publication lists microcomputer software for teaching Basic Skills Assessment Program (BSAP) objectives in mathematics for grades 1 through 8 in South Carolina. Software reviews were examined and 63 programs that had been given good reviews were chosen for inclusion. The software programs were then correlated and coded to the mathematics objectives for concepts, operations, measurement, geometry, and problem-solving. For each program, title, producer, copyright date, current price, system requirements, grade level, group size, instructional mode, and objective are noted. Also included in the publication are the mathematics objectives with suggested measurement strategies, a reprint of the National Council of Teachers of Mathematics guide to the evaluation of instructional software, and addresses of software producers. (MNS)

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MATH SOFTWARE BSAP CORRELATION
GRADES 1-8

ED257639

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ADVISORY LISTING OF MICROCOMPUTER PROGRAMS CORRELATED TO GRADES 1-8 BSAP OBJECTIVES

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May 1984

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INTRODUCTION

A Microcomputer Math Advisory Committee composed of in-state consultants, out-of-state consultants, and Department of Education personnel participated in planning conferences on April 5 and May 10, 1984. These conferences, jointly funded by the State Department of Education and the Appalachia Educational Laboratory (AEL), convened to prepare a publication that would be of value to school districts who plan to use microcomputer math software grades 1-8 to teach BSAP Math Objectives. This publication contains the material developed by these conference participants.

These conference participants examined grades 1-8 math software reviews that had been collected from the major microcomputer review services in the U. S. Those math software programs that had been given good reviews were chosen for inclusion in this publication. Conference participants also used their own knowledge of many of the programs in deciding whether or not to include them.

The selected software programs were then correlated to the math grades 1-8 BSAP Objectives by the numbering system below. Please note that a particular program might be correlated to more than one objective.

Grades	1	2	3	4	5	6	7	8
Concepts	1-1	2-1	3-1	4-1	5-1	6-1	7-1	8-1
Operations	1-2	2-2	3-2	4-2	5-2	6-2	7-2	8-2
Measurement	1-3	2-3	3-3	4-3	5-3	6-3	7-3	8-3
Geometry	1-4	2-4	3-4	4-4	5-4	6-4	7-4	8-4
Problem Solving	1-5	2-5	3-5	4-5	5-5	6-5	7-5	8-5

This correlation of selected software to BSAP Math Objectives should be used only as a beginning point in the selection, purchase, and use of any of the software. Before buying any of these programs, each should be previewed and selected on the basis of your individual instructional needs or objectives. Software may receive good reviews and work well for others but not meet your needs. Ultimately one must individually select software for identified needs.

Also included in this publication is other pertinent information such as cost, publisher, computer required for running each program, etc.

If you have questions concerning the software in this publication, please contact the Office of Instructional Technology, State Department of Education, Room 205, Rutledge Building, Columbia, South Carolina 29201.

Appreciation is expressed to all Conference participants who developed these materials.

Clyde H. Green, Director
Office of Instructional Technology

CORRELATION OF MICROCOMPUTER SOFTWARE BY GRADES TO BSAP MATH OBJECTIVES

The software in this publication is correlated below to each BSAP math objective for grades 1-8. In this correlation, each software program has been assigned a number. On pages 1 - 16 of the publication, this software is arranged alphabetically and complete information about each title is included. A reminder - REVIEW SOFTWARE BEFORE PURCHASE.

BSAP OBJECTIVE - CONCEPTS

GRADE 1- 8, 14, 15, 16, 17, 23, 38, 39, 44, 48, 50, 56
2- 5, 8, 10, 14, 15, 16, 17, 23, 38, 39, 44, 48, 50, 51
3- 5, 8, 9, 10, 14, 15, 16, 23, 25, 38, 39, 43, 44, 48, 50, 51
4- 5, 8, 9, 10, 11, 14, 15, 16, 24, 25, 29, 30, 34, 38, 39, 41, 43, 44, 48, 50, 51, 59, 61
5- 2, 5, 8, 9, 10, 11, 14, 15, 16, 24, 25, 27, 29, 30, 34, 35, 38, 39, 41, 43, 44, 48, 51, 59, 61
6- 2, 5, 9, 10, 11, 14, 15, 16, 19, 24, 27, 29, 30, 34, 35, 39, 41, 43, 44, 48, 51, 58, 59, 61
7- 2, 9, 10, 11, 14, 15, 16, 19, 24, 27, 29, 30, 34, 35, 39, 41, 43, 44, 48, 58, 59, 61
8- 2, 9, 10, 11, 14, 15, 16, 19, 24, 27, 29, 30, 34, 35, 39, 41, 43, 44, 48, 58, 59, 61

BSAP OBJECTIVE - OPERATIONS

GRADE 1- 1, 3, 7, 14, 15, 16, 17, 18, 22, 23, 28, 38, 39, 42, 44, 52, 55, 57
2- 1, 3, 4, 5, 7, 10, 14, 15, 16, 17, 18, 22, 23, 28, 38, 39, 42, 44, 49, 52, 55, 57
3- 3, 4, 5, 7, 10, 14, 15, 16, 17, 19, 20, 23, 28, 31, 36, 38, 39, 40, 42, 43, 44, 49, 52, 55, 57
4- 3, 4, 5, 7, 10, 11, 14, 15, 16, 17, 19, 20, 21, 24, 28, 29, 31, 34, 36, 38, 39, 40, 41, 42, 43, 44, 49, 55, 57, 61
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7- 4, 10, 11, 14, 15, 16, 17, 19, 21, 24, 28, 29, 31, 34, 36, 37, 39, 40, 41, 43, 44, 46, 57, 58, 61, 63
8- 4, 10, 11, 14, 15, 16, 17, 19, 21, 24, 28, 29, 31, 32, 34, 36, 39, 40, 41, 43, 44, 46, 57, 58, 61, 63

BSAP OBJECTIVE - MEASUREMENT

GRADE 1- 12, 15, 39, 47
2- 12, 15, 39, 47
3- 12, 15, 39, 43, 47
4- 11, 12, 15, 26, 34, 39, 43
5- 11, 12, 15, 26, 34, 39, 43
6- 11, 12, 15, 26, 34, 39, 43, 58
7- 11, 15, 26, 34, 39, 43, 58
8- 11, 15, 26, 34, 39, 43, 58

BSAP GEOMETRY

GRADE 1- 15, 39
2- 15, 39
3- 15, 39, 43, 60
4- 11, 15, 39, 60
5- 11, 15, 27, 39, 60
6- 11, 15, 27, 39, 44, 60
7- 11, 15, 27, 39, 44, 60
8- 11, 15, 27, 39, 41, 44, 60

BSAP OBJECTIVE - PROBLEM SOLVING

GRADE 1- 8, 15, 18, 32, 33, 39, 48
2- 4, 8, 10, 15, 18, 32, 33, 39, 48
3- 4, 5, 6, 8, 9, 10, 15, 18, 32, 33, 36, 39, 43, 45, 48, 60
4- 4, 5, 6, 8, 9, 10, 11, 13, 15, 18, 32, 33, 34, 36, 39, 43, 45, 48, 54, 59, 60, 62
5- 4, 5, 6, 8, 9, 10, 11, 13, 15, 32, 34, 36, 39, 43, 45, 48, 53, 59, 60, 62
6- 4, 5, 6, 9, 10, 11, 13, 15, 32, 34, 36, 39, 43, 45, 48, 53, 54, 58, 59, 60, 62
7- 4, 6, 9, 10, 11, 13, 15, 34, 36, 39, 43, 48, 53, 54, 58, 59, 60, 62
8- 4, 6, 9, 10, 11, 13, 15, 34, 36, 39, 43, 48, 53, 54, 58, 59, 60, 62

MATH SOFTWARE BSAP CORRELATION
Grades 1-8

1. Title: ADDITION AND SUBTRACTION 1 & 2
Producer: Scott, Foresman and Company
Copyright: 1981
Price: $39.95
System Requirement: (Computer/Memory) TI 99/4A/16K/cartridge/Color monitor/BASIC
TI Speech Synthesizer optional
Grade Level: 1-2
Group Size: Individual or small group
Instructional Mode: Drill and practice
BSAP Objective: 1-2; 2-2

2. Title: ADVENTURES WITH FRACTIONS
Producer: MECC
Copyright: 1983
Price: $45
System Requirement: (Computer/Memory) Apple, 48K
Grade Level: 5-8
Group Size: Individual
Instructional Mode: Tutorial
BSAP Objective: 5-1; 6-1; 7-1; 8-1

3. Title: ARCADEMIC SKILL BUILDERS
Producer: Developmental Learning Materials
Copyright: 1982
Price: $39 program, $220 set of 6 (ALIEN ADDITION, MINUS MISSION, DRAGON MIX, METEOR MULTIPLICATION DEMOLITION DIVISION, ALLIGATOR MIX)
System Requirement: (Computer/Memory) Apple II, Applesoft/48K/disk (paddle optional)
Grade Level: 1-6
Group Size: Individual
Instructional Mode: Arcade type game
BSAP Objective: 1-2; 2-2; 3-2; 4-2; 5-2; 6-2

4. Title: ARITH-MAGIC
Producer: Quality Educational Designs
Copyright: 1982
Price: $35
System Requirement: (Computer/Memory) Apple II, Applesuft/48K/DOS 3.3 or 32K/DOS 3.2
PET/CBM, 16K/disk or cassette
TRS-80 Model I level 2 or Model III/32K/disk or 16K/cassette
Grade Level: 2-9
Group Size: Individual, small group
Instructional Mode: Educational game/tutorial
BSAP Objective: 2-2,5; 3-2,5; 4-2,5; 5-2,5; 6-2,5; 7-2,5; 8-2,5

5. Title: ARITHMETIC GAMES
Producer: Science Research Associates, Inc. (SRA)
Copyright: 1981
Price: $150
System Requirement (Computer/Memory): 48K Apple II Plus or 48K Apple with Applesoft Firmware Card, disk drive, color monitor (optional)
Grade Level: 2-6
Group Size: Individual, small group, class
Instructional Mode: Skills practice, game
BSAP Objective: 2-1,2,5; 3-1,2,5; 4-1,2,5; 5-1,2,5; 6-1,2,5

6. Title: BAGELS
Producer: Minnesota Educational Computing Consortium Publications
Copyright: 1980
Price: $30, per diskette
System Requirement (Computer/Memory): Apple II or II+/32K/disk drive/Applesoft BASIC
Atari 400 or 800/16K/disk drive/BASIC
Grade Level: Elementary
Group Size: Individual or small group
Instructional Mode: Educational game
BSAP Objective: 3-5; 4-5; 5-5; 6-5; 7-5; 8-5

7. Title: BASIC MATH SKILL GAMES
Producer: Mentor Software
Copyright: 1978
Price: $94.95
System Requirement (Computer/Memory): 32K Apple II with Applesoft II BASIC ROM card or TRS-80 Model I level II, disk drive(s)
Grade Level: K-4
Group Size: Individual
Instructional Mode: Drill and practice, educational game
BSAP Objective: 1-2; 2-2; 3-2; 4-2

8. Title: BUMBLE GAMES
Producer: The Learning Company
Copyright: 1982
Price: $39.95
System Requirement (Computer/Memory): Apple II, Applesoft, 48K/disk(DOS 3.3)
TRS-80 color computer (in preparation)
Grade Level: K-3
Group Size: Individual, small group
Instructional Mode: Educational game, tutorial, problem solving
BSAP Objective: 1-1,5; 2-1,5; 3-1,5; 4-1,5; 5-1,5

9. Title: BUMBLE PLOT
Producer: Apple Version: The Learning Company; TRS-80 color computer version: Follett Library Book Company
Copyright: 1982
Price: $39.95
System Requirement: Apple II, II+ or IIe/48K/disk drive/color monitor
TRS-80 color computer/16K/disk drive or cassette recorder/
Color monitor. Joy sticks optional
Grade Level: 3-8
Group Size: Individual, small group or class
Instructional Mode: Tutorial, educational game, logic & problem solving
BSAP Objective: 3-1,5; 4-1,5; 5-1,5; 6-1,5; 7-1,5; 8-1,5

10. Title: CHALLENGE MATH
Producer: Sunburst Communications, Inc.
Copyright: 1982, 1983
Price: $49
System Requirement: Apple II, II+ or IIe/48K/disk drive/BASIC
(Computer/Memory) Commodore 64/disk drive/BASIC
Color monitor optional
Grade Level: 2-6
Group Size: Individual or small group
Instructional Mode: Drill and practice, educational game
BSAP Objective: 2-1,2,5; 3-1,2,5; 4-1,2,5; 5-1,2,5; 6-1,2,5;
7-1,2,5; 8-1,2,5

11. Title: CLASSROOM MANAGEMENT SYSTEM: MATHEMATICS, LEVEL B
Producer: Science Research Associates, Inc. (SRA)
Copyright: 1980
Price: $595
System Requirement: 48K Apple II Plus or 48K Apple with Applesoft, disk
(Computer/Memory) drive, printer
Grade Level: 4-8
Group Size: Individual
Instructional Mode: Class management
BSAP Objective: 4-1,2,3,4,5; 5-1,2,3,4,5; 6-1,2,3,4,5; 7-1,2,3,4,5;
8-1,2,3,4,5

12. Title: CLOCK
Producer: Hartley Courseware, Inc.
Copyright: 1983
Price: $39.95
System Requirement: Apple II, Applesoft, 48K/disk (printer optional)
(Computer/Memory)
Grade Level: 1-6
Group Size: Individual, small group
Instructional Mode: Drill and practice/tutorial/diagnostic
BSAP Objective: 1-3; 2-3; 3-3; 4-3; 5-3; 6-3

13. Title: COLOR KEYS: STRATEGIES IN PROBLEM SOLVING
Producer: Sunburst
Copyright: 1983
Price: $50
System Requirement (Computer/Memory): Apple II/II+/IIe, disk drive, Applesoft, DOS 3.3
Grade Level: 4-13
Group Size: Individual
Instructional Mode: Simulation, game
BSAP Objective: 4-5; 5-5; 6-5; 7-5; 8-5

14. Title: COMPUTER DRILL AND INSTRUCTION: MATHEMATICS
Producer: Science Research Associates, Inc. (SRA)
Copyright: 1981
Price: LEVEL A. Managed: $325, Unmanaged: $210
LEVEL B. Managed: $425, Unmanaged: $330
LEVEL C. Managed: $475, Unmanaged: $400
Copyright: 1983 LEVEL D. Managed: $575 - Grades 7 & 8
System Requirement (Computer/Memory): 48K Apple II Plus or 48K Apple II with Applesoft, disk drive, printer (optional)
Grade Level: 4-8
Group Size: Individual, small group, class
Instructional Mode: Skills practice, tutorial
BSAP Objective: 1-1,2; 2-1,2; 3-1,2; 4-1,2; 4-1,2; 5-1,2; 6-1,2; 7-1,2; 8-1,2

15. Title: COMPUTER MATH ACTIVITIES VOLUMES I - V
Producer: Addison-Wesley Publishing Company
Copyright: 1983
Price: $15.00 per Volume
System Requirement (Computer/Memory): 32K Apple II, single disk drive, monitor
Grade Level: 1-9
Group Size: Individual and classroom
Instructional Mode: Drill and practice, educational game
BSAP Objective: 1-1,2,3,4,5; 2-1,2,3,4,5; 3-1,2,3,4,5; 4-1,2,3,4,5; 5-1,2,3,4,5; 6-1,2,3,4,5; 7-1,2,3,4,5; 8-1,2,3,4,5

16. Title: COMPUTER MATH GAMES, VOLUME I
Producer: Addison-Wesley Publishing Company
Copyright: 1982
Price: $324 for 7 Volume series. Individual Volumes 1, 2, 3, 4, 6, $54 each, Volume 5 $39, and Volume 7 $45
System Requirement (Computer/Memory): 32K Apple II, Apple II+, or Apple IIe; single disk drive; monitor or television
Grade Level: 1 through 9
Group Size: Individual
Instructional Mode: Drill and practice, game
BSAP Objective: 1-1,2; 2-1,2; 3-1,2; 4-1,2; 5-1,2; 6-1,2; 7-1,2; 8-1,2

17. itle: COMPUTER PROGRAMS IN A SERIES
Producer: Radio Shack
Copyright: 1980
Price: $199
System Requirement (Computer/Memory): TRS-80 16K Model I with level II BASIC or 16K Model III/with Model III BASIC/disk drive(s), compatible cassette tape player (optional)
Grade Level: K-8
Group Size: Individual
Instructional Mode: Drill and practice
BSAP Objective: 1-1,2; 2-1,2; 3-2; 4-2; 5-2; 6-2; 7-2; 8-2

18. Title: CUBBYHOLES
Producer: Atari Program Exchange
Copyright: 1982
Price: $17.95
System Requirement (Computer/Memory): Atari 400/800, 24K disk or 16K cassette, joysticks
Grade Level: 1 and up
Group Size: Individual, small group
Instructional Mode: Educational game
BSAP Objective: 1-2,5; 2-2,5; 3-2,5; 4-2,5

19. Title: DECIMAL SKILLS
Producer: Milton Bradley Company
Copyright: 1982
Price: $49.95, $20.00 back-up, $6.00 demo and guide
System Requirement (Computer/Memory): Apple II, II+ or IIe/48K/disk drive/Applesoft BASIC
Grade Level: 6 and up
Group Size: Individual or small group
Instructional Mode: Drill and practice with classroom management
BSAP Objective: 6-1,2; 7-1,2; 8-1,2

20. Title: DIVISION 1
Producer: Scott, Foresman and Company
Copyright:
Price: $39.95
System Requirement (Computer/Memory): TI 99/4 and TI 99/4A, color video, speech synthesizer (headset and adapter optional)
Grade Level: 3-5
Group Size: Individual
Instructional Mode: Drill and practice, tutorial
BSAP Objective: 3-2; 4-2; 5-2

21. Title: DIVISION SKILLS
Producer: Milton Bradley Company
Copyright: 1982
Price: $49.95
System Requirement: Apple II, II+ or IIe/48K/disk drive/Applesoft BASIC
(Computer/Memory) Color monitor optional
Grade Level: 6-8
Group Size: Individual, small group or class
Instructional Mode: Tutorial, drill and practice with classroom management
BSAP Objective: 4-2; 5-2; 6-2; 7-2; 8-2

22. Title: EARLY ADDITION
Producer: MECC
Copyright: 1983
Price: $45
System Requirement: Apple 48K
(Computer/Memory) color monitor
Grade Level: 1-2
Group Size: Individual
Instructional Mode: Drill and practice
BSAP Objective: 1-2; 2-2

23. Title: EARLY GAMES FOR YOUNG CHILDREN
Producer: Counterpoint Software, Inc.
Copyright: 1983
Price: $29.95
System Requirement: Apple II/II+/48K/IIe/DOS 3.3/diskette
(Computer/Memory) Atari 400/800/1200/16K/cassette/24K/diskette
Commodore 64/cassette, diskette
Commodore VIC-20/cassette, diskette
IBM-PC/diskette
TI-99/4A/cassette/diskette
TRS-80 Model I, III/cassette/diskette
TRS-80 Color Computer/cassette/diskette
Grade Level: Preschool - 3
Group Size: Individual or small group
Instructional Mode: Skills practice, educational game
BSAP Objective: 1-1,2; 2-1,2; 3-1,2

24. Title: ELEMENTARY MATHEMATICS CLASSROOM LEARNING SYSTEM
Producer: Sterling Swift Publishing Co.
Copyright: 1982
Price: $495 for first set, $295 for subsequent sets billed to same account, $9.95 for "Hands-On Preview" diskette with sample documentation (refundable upon purchase of a set)
System Requirement: Apple II, II+ or IIe/48K/disk drive/Applesoft BASIC
(Computer/Memory) Game paddles required for one of the Supplementary games
Disk sharing version available, printer optional
ACORN/64K
Grade Level: 4-8
Group Size: Individual or small group
Instructional Mode: Drill and practice with classroom management, tutorial, educational game
BSAP Objective: 4-1,2; 5-1,2; 6-1,2; 7-1,2; 8-1,2

25. Title: EXPANDED NOTATION
Producer: Hartley Courseware, Inc.
Copyright: 1982
Price: $29.95
System Requirement (Computer/Memory): 48K Apple, single disk drive, printer (optional)
Grade Level: 3-5
Group Size: Individual, small group
Instructional Mode: Drill and practice, tutorial
BSAP Objective: 3-1; 4-1; 5-1

26. Title: EXPLORER METROS: A METRIC ADVENTURE
Producer: Sunburst Communications, Inc.
Copyright: 1982
Price: $49
System Requirement (Computer/Memory): Apple II, II+ or IIe/48K/DOS 3.3/disk drive/Applesoft BASIC
Color monitor optional
Grade Level: 4 - Adult
Group Size: Individual or small group
Instructional Mode: Simulation, educational game
BSAP Objective: 4-3; 5-3; 6-3; 7-3; 8-3

27. Title: FACTORING WHOLE NUMBERS
Producer: Quality Educational Designs
Copyright: 1983
Price: $90
System Requirement (Computer/Memory): Apple II, Applesoft, 48K (DOS 3.3) or 32K/DOS 3.2
PET/CBM, 16K/disk or cassette
TRS-80 Model I level 2 or Model III/32K/disk or 16K cassette
Grade Level: 5-11
Group Size: Individual, small group
Instructional Mode: Tutorial/drill and practice
BSAP Objective: 5-1,4; 6-1,4; 7-1,4; 8-1,4

28. Title: FAST TRACK
Producer: Science Research Associates, Inc. (SRA)
Copyright: 1981
Price: $75
System Requirement (Computer/Memory): 48K Apple II Plus or Apple II with Applesoft firmware card, disk drive
Grade Level: 1-12
Group Size: Individual
Instructional Mode: Drill and practice
BSAP Objective: 1-2; 2-2; 3-2; 4-2; 5-2; 6-2; 7-2; 8-2

29. Title: FRACTIONS
Producer: Quality Educational Designs
Copyright: 1979, 1981, 1982
Price: $175
System Requirement (Computer/Memory): TRS-80 Model I or III/16K cassette recorder or 32K disk drive BASIC, Apple II or II+/32K for DOS 3.2 or 48K for DOS 3.3/disk drive/Applesoft/BASIC, PET/16K/cassette recorder or disk drive/BASIC
Grade Level: Upper elementary or middle school students
Group Size: Individual
Instructional Mode: Drill and practice, Tutorial, Educational game
BSAP Objective: 4-1,2; 5-1,2; 6-1,2; 7-1,2; 8-1,2

30. Title: FRACTIONS PRACTICE (PLATO)
Producer: Control Data Publishing Company
Copyright: 1983
Price: $60
System Requirement (Computer/Memory): 48K Apple II+/disk drive, TV or monitor
Atari 800, TI 99/4A, IBM-PC
Applesoft, DOS 3.3
Grade Level: 4-9
Group Size: Individual
Instructional Mode: Drill and practice, educational game
BSAP Objective: 4-1; 5-1; 6-1; 7-1; 8-1

31. Title: GALAXY MATH FACTS GAME
Producer: Random House School Division
Copyright: 1981
Price: $147 diskette, $99 cassette
System Requirement (Computer/Memory): Apple II+ or IIe/48K/disk drive/Applesoft BASIC
TRS-80 Model I or III/16K cassette recorder or 48K disk drive/BASIC. Networking available for disk versions.
Grade Level: 1-9
Group Size: Individual
Instructional Mode: Drill and practice, Educational game
BSAP Objective: 3-2; 4-2; 5-2; 6-2; 7-2; 8-2

32. Title: GERTRUDE'S PUZZLES
Producer: The Learning Company
Copyright: 1983
Price: $44.95
System Requirement (Computer/Memory): Apple II, Applesoft, 48K/disk (DOS 3.3)
Grade Level: 1-6
Group Size: Individual, small group
Instructional Mode: Educational game
BSAP Objective: 1-5; 2-5; 3-5; 4-5; 5-5; 6-5

33. Title: GERTRUDE'S SECRETS
Producer: The Learning Company
Copyright: 1983
Price: $44.95
System Requirement (Computer/Memory): Apple II, Applesoft, 48K/disk (DOS 3.3)
Grade Level: Pre K-4
Group Size: Individual, small group
Instructional Mode: Educational game
BSAP Objective: 1-5; 2-5; 3-5; 4-5

34. Title: GOLF CLASSIC/COMPUBAR
Producer: Milliken Publishing Company
Copyright: 1982
Price: $39.95 diskette, $34.95 cassette
School package: $44.95 diskette, $39.95 cassette (includes supplementary materials) Back-up copies available at 1/2 price
System Requirement (Computer/Memory): Apple II, II+ or IIe/16K cassette recorder or 32K disk drive/ BASIC and Assembler
Atari 400 or 800/16K cassette recorder or 32K/disk drive/ Atari BASIC cartridge and Assembler - Color monitor optional
Grade Level: 4 and above
Group Size: Individual or small group
Instructional Mode: Educational game, logic and problem solving
BSAP Objective: 4-1,2,3,5; 5-1,2,3,5; 6-1,2,3,5; 7-1,2,3,5; 8-1,2,3,5

35. Title: GROWGIN'S FRACTIONS
Producer: MECC
Copyright: 1983
Price: $45
System Requirement (Computer/Memory): Apple 48K
Grade Level: 5-8
Group Size: Individual
Instructional Mode: Tutorial, educational game
BSAP Objective: 5-1; 6-1; 7-1; 8-1

36. Title: GUINNESS WORLD RECORDS PROBLEM AREAS IN MATH
Producer: Society for Visual Education (SVE)
Copyright: 1982
Price: $225
System Requirement (Computer/Memory): 48K/Apple II Plus or 48K/Apple II with Applesoft, color monitor, disk drive
Grade Level: 3-7
Group Size: Individual or small group
Instructional Mode: Tutorial
BSAP Objective: 3-2,5; 4-2,5; 5-2,5; 6-2,5; 7-2,5; 8-2,5

37. Title: INTEGERS
Producer: Edu-Soft
Copyright: 1982
Price: $19.95 diskette, $14.95 cassette
System Requirement (Computer/Memory): TRS-80 Model I or III/16K/disk drive or cassette recorder/BASIC
Grade Level: 5-12
Group Size: Individual or small group
Instructional Mode: Drill and practice
BSAP Objective: 6-2; 7-2; 8-2

38. Title: LEARNING ABOUT NUMBERS
Producer: C & C Software
Copyright: 1983
Price: $40
System Requirement (Computer/Memory): Apple II/II+/IIe/48K/disk drive/BASIC and machine language
Grade Level: Pre K-5
Group Size: Individual, small group
Instructional Mode: Drill and practice with classroom management
BSAP Objective: 1-1,2; 2-1,2; 3-1,2; 4-1,2; 5-1,2

39. Title: LOGO
Producer: Versions of LOGO have been written by a number of companies for a variety of computers. A color monitor is recommended for use with all versions.
Apple LOGO - Apple Computer Inc.
Atari LOGO - Atari Inc.
Commodore LOGO - Commodore Business Machines, Inc.
PC LOGO - Harvard Associates
Terrapin LOGO - Terrapin, Inc.
TI LOGO - Texas Instruments, Inc.
Krell LOGO - Krell Software
Copyright:
Price: Apple - $70
Atari - Under $100
Commodore - $99.95
PC - $199.95
Terrapin - $149.95 Floppy disk, $300 Hard disk
TI - $129.95
Krell - $89.95
System Requirement (Computer/Memory): Apple II/II+/64K/IIe: DOS 3.3/diskette
Atari 400, 800 or 1200XL/cartridge
Commodore 64 with 1541 floppy disk drive
IBM PC/64K: IBM DOS 1.0/diskette
TI-99/4A with Peripheral Expansion Box, 32K memory-expansion card
Grade Level: Preschool - 9
Group Size: Individual, small group
Instructional Mode: These LOGO software packages in and of themselves will not teach BSAP Objectives. They may, however, be adapted by teachers and used for that purpose.
BSAP Objective: 1-1,2,3,4,5; 2-1,2,3,4,5; 3-1,2,3,4,5; 4-1,2,3,4,5; 5-1,2,3,4,5; 6-1,2,3,4,5; 7-1,2,3,4,5; 8-1,2,3,4,5

40. Title: LONG DIVISION
Producer: Educational Activities, Inc.
Copyright: 1983
Price: $16.95
System Requirement (Computer/Memory): Apple II, Applesoft, 48K/disk
Atari, 32K/disk
PET/CBM, 16K/disk or 8K/cassette
TRS-80 Model I level 2 or Model III, 32K/disk or 16K/cassette
Grade Level: 3-6
Group Size: Individual, small group
Instructional Mode: Tutorial/drill and practice
BSAP Objective: 3-2; 4-2; 5-2; 6-2; 7-2; 8-2

41. Title: MATHEMATICAL CONCEPTS
Producer: Milton Bradley
Copyright: 1982
Price: $44.95 each box (3 boxes)
System Requirement (Computer/Memory): 48K Apple II Plus or 48K Apple with Applesoft, disk drive, game paddle
Grade Level: 4-9
Group Size: Individual, small group
Instructional Mode: Drill and practice
BSAP Objective: 4-1,2; 5-1,2; 6-1,2; 7-1,2; 8-1,2

42. Title: MATHEMATIC-TAC-TOE
Producer: Atari Program Exchange
Copyright: 1983
Price: $15.95
System Requirement (Computer/Memory): Atari 400/800, 24K disk or 16K cassette
Grade Level: 1-6
Group Size: Individual
Instructional Mode: Drill and practice/Educational game
BSAP Objective: 1-2; 2-2; 3-2; 4-2; 5-2; 6-2

43. Title: MATHWARE, BASIC MATH
Producer: Math City
Copyright: 1981
Price: $350 for System S, $59 per diskette for System H
System Requirement (Computer/Memory): Apple II or II+/48K/disk drive/Applesoft BASIC
Printer optional
Grade Level: 2-8
Group Size: Individual
Instructional Mode: Tutorial, drill and practice with classroom management
BSAP Objective: 3-1,2,3,4,5; 4-1,2,3,4,5; 5-1,2,3,4,5; 6-1,2,3,4,5; 7-1,2,3,4,5; 8-1,2,3,4,5

44. Title: MATH SEQUENCES
Producer: Milliken Publishing Company
Copyright: 1983
Price: $450
System Requirement (Computer/Memory): Apple IIe/48K, disk drive, Applesoft, DOS 3.3, Atari 400/800, 40K/disk drive/DOS; Commodore PET, 8K/BASIC; Radio Shack TRS-80, Model I, III, IV/16K/BASIC
Grade Level: 1-8
Group Size: Individual
Instructional Mode: Drill and practice
BSAP Objective: 1-1,2; 2-1,2; 3-1,2; 4-1,2; 5-1,2; 6-1,2; 7-1,2,4; 8-1,2,4

45. Title: MATH WORD GAMES
Producer: McGraw-Hill
Copyright: 1983
Price: $38.25
System Requirement (Computer/Memory): Apple II, Applesoft, 48K/disk (DOS 3.3)
PET/CBM, 8K/cassette
TRS-80 Model III/32K/disk
Grade Level: 3-6
Group Size: Individual
Instructional Mode: Drill and practice
BSAP Objective: 3-5; 4-5; 5-5; 6-5

46. Title: MIXED NUMBERS
Producer: Milton Bradley
Copyright: 1982
Price: $49.95
System Requirement (Computer/Memory): Apple II, II+ or IIe/48K/disk drive/Applesoft BASIC
Grade Level: 6-8
Group Size: Individual or small group
Instructional Mode: Tutorial, drill and practice with classroom management
BSAP Objective: 5-2; 6-2; 7-2; 8-2

47. Title: MONEY! MONEY!
Producer: Hartley
Copyright: 1983
Price: $40
System Requirement (Computer/Memory): Apple II/IIe/48K/disk drive, Applesoft DOS 3.3
Grade Level: 1-5 (Remedial and Special Education)
Group Size: Individual or small group
Instructional Mode: Skills practice, tutorial
BSAP Objective: 1-3; 2-3; 3-3

48. Title: MOPTOWN PARADE
Producer: Learning Company
Copyright: 1983
Price: $50
System Requirement (Computer/Memory): Apple II/IIe/48K/disk drive, Applesoft, DOS 3.3
Radio Shack, color computer, 16K/disk drive. Extended BASIC
Grade Level: 1-5
Group Size: Individual, small group
Instructional Mode: Tutorial, educational game
BSAP Objective: 1-1,5; 2-1,5; 3-1,5; 4-1,5; 5-1,5; 6-1,5

49. Title: MULTIPLICATION 1
Producer: Scott, Foresman
Copyright: 1981
Price: $44.95
System Requirement (Computer/Memory): TI 99/4 or TI 99/4A, speech synthesizer (optional)
Grade Level: 2-5
Group Size: Individual, small group
Instructional Mode: Skills practice, tutorial
BSAP Objective: 2-2; 3-2; 4-2; 5-2

50. Title: NUMBER WORDS - LEVEL 1
Producer: Hartley Courseware, Inc
Copyright: 1983
Price: $26.95
System Requirement (Computer/Memory): 48K Apple with one disk drive, monitor, printer (optional)
Grade Level: 2-4
Group Size: Individual
Instructional Mode: Drill and practice
BSAP Objective: 1-1; 2-1; 3-1; 4-1

51. Title: NUMBER WORDS - LEVEL 2
Producer: Hartley Courseware, Inc.
Copyright: 1982
Price: $29.95
System Requirement (Computer/Memory): 48K Apple with one disk drive, monitor, printer (optional)
Grade Level: 2-5
Group Size: Individual
Instructional Mode: Drill and practice
BSAP Objective: 2-1; 3-1; 4-1; 5-1; 6-1

52. Title: PRESCRIPTIVE MATH DRILL
Producer: Hartley Courseware, Inc.
Copyright: 1981, 1983
Price: $79.95
System Requirement (Computer/Memory): Apple II, II+ or IIe/48K/disk drive/Applesoft BASIC and Machine language
Grade Level: 1-4
Group Size: Individual
Instructional Mode: Drill and practice with classroom management
BSAP Objective: 1-2; 2-2; 3-2; 4-2

53. Title: PROBLEM SOLVING STRATEGIES
Producer: MECC
Copyright: 1983
Price: $45
System Requirement (Computer/Memory): Apple II/II+/IIe, disk drive, Applesoft DOS 3.3
Grade Level: 5-12
Group Size: Individual, small group
Instructional Mode: Tutorial, class management
BSAP Objective: 5-5; 6-5; 7-5; 8-5

54. Title: SELL LEMONADE (ELEM. VOLUME 3)
Producer: MECC Distribution Center
Copyright: 1982
Price: $38 Apple, $36 Atari
System Requirement (Computer/Memory): Apple II/II+/48K/IIe: DOS 3.3/diskette. Atari 400, 800/diskette
Grade Level: 4-5 Enrichment, 5-7 Regular, 8-9 Remedial
Group Size: Individual or small groups
Instructional Mode: Simulation
BSAP Objective: 4-5; 5-5; 6-5; 7-5; 8-5

55. Title: SOCCER MATH
Producer: COMPU-TATIONS, Inc.
Copyright: 1982
Price: $24.95 (version compatible with VOTRAX Type-'n'-Talk(TM) speech synthesizer, $29.95)
System Requirement (Computer/Memory): Apple II, Applesoft/48K/disk (DOS 3.3)
Grade Level: 1-6
Group Size: Individual, small group
Instructional Mode: Educational Game
BSAP Objective: 1-2; 2-2; 3-2; 4-2; 5-2; 6-2

56. Title: STICKYBEAR NUMBERS
Producer: Xerox Education Publications
Copyright: 1983
Price: $39.95
System Requirement (Computer/Memory): Apple II/II+/IIe, 48K/RAM, single disk drive
Grade Level: Preschool through Grade 1
Group Size: Individual or small group
Instructional Mode: Drill and practice
BSAP Objective: 1-1

57. Title: SUPER DRILL AND SUPER DRILL TEACHER
Producer: Total Information Educational Systems (TIES)
Copyright: 1983
Price: $49.95 (including back-up diskette)
System Requirement (Computer/Memory): Apple II, II+/32K, IIe/DOS 3.3/diskette
Grade Level: 1-6 Regular, 7-9 Remedial
Group Size: Individual or small group
Instructional Mode: Drill and practice, educational game
BSAP Objective: 1-2; 2-2; 3-2; 4-2; 5-2; 6-2; 7-2; 8-2

58. Title: SURVIVAL MATH
Producer: Sunburst Communications
Copyright: 1982, 1983
Price: $50
System Requirement (Computer Memory): Apple II, II+ or IIe/DOS 3.3/32K/disk drive/Applesoft BASIC
Atari 400, 800, 600XL, 800XL, 1200XL, 1400XL or 1450XL/16K/disk drive/BASIC
Commodore 64/64K/disk drive/BASIC
TRS-80 Model I, III or IV/16K cassette recorder or 32K disk drive/BASIC
Grade Level: 6 - Adult
Group Size: Individual or small group
Instructional Mode: Drill and practice, simulation
BSAP Objective: 6-1,2,3,5; 7-1,2,3,5; 8-1,2,3,5

59. Title: TAXMAN (ELEM. VOLUME 1)
Producer: MECC Distribution Center
Copyright: 1982
Price: $36 Apple, $37 Atari
System Requirement (Computer/Memory): Apple II/II+/48K/IIe/DOS 3.3/diskette
Atari 400, 800/16K/diskette
Grade Level: 4-8
Group Size: Individual or small group
Instructional Mode: Educational game
BSAP Objective: 4-1,5; 5-1,5; 6-1,5; 7-1,5; 8-1,5

60. Title: TEASERS BY TOBBS
Producer: Sunburst Communications
Copyright: 1982
Price: $49 diskette, $39 cassette
System Requirement (Computer/Memory): Apple II+ or IIe/48Kdisk drive/Applesoft BASIC
Atari 400 or 800/24K/disk drive/BASIC
TRS-80 Model I or III/16K cassette recorder or 32K disk drive/BASIC
Grade Level: Grade 4 to Adult
Group Size: Individual or small group
Instructional Mode: Logic and problem solving, educational game, drill and practice
BSAP Objective: 4-2,5; 5-2,5; 6-2,5; 7-2,5; 8-2,5

61. Title: THE ARITHMETIC CLASSROOM
Producer: Sterling Swift Publishing Company
Copyright: 1982
Price: $49.95 each for the 8 individual lesson packages: Addition, Subtraction, Multiplication, Division, Fractions-Basic Concepts-Part I, Fractions-Addition & Subtraction-Part II, Fractions-Multiplication & Division-Part III, Decimals
$29.95 for the Games package
System Requirement (Computer/Memory): Apple II, II+ or IIe/48Kdisk drive/Applesoft BASIC
Game paddle required for one program in the Games package
ACORN 64/K
Grade Level: 4-12
Group Size: Individual
Instructional Mode: Drill and practice, tutorial, educational game
BSAP Objective: 4-1,2; 5-1,2; 6-1,2; 7-1,2; 8-1,2

62. Title: THE FACTORY
Producer: Sunburst Communications, Inc.
Copyright: 1983
Price: $49
System Requirement (Computer/Memory): 16K Atari 400, 600XL, 800, 800XL, 1200XL, 1400XL, 1450XL, color monitor or TV with adapter and one disk drive
Apple II/II+/IIe, Commodore 64, and TRS-80 Color or Color 2
Atari BASIC, DOS 3.2
Grade Level: 4-12
Group Size: Individual, small group discussion, large group activity
Instructional Mode: Problem solving, simulation
BSAP Objective: 4-5; 5-5; 6-5; 7-5; 8-5

63. Title: WHOLE NUMBERS PRACTICE (PLATO)
Producer: Control Data Publishing Company
Copyright: 1983
Price: $60
System Requirement (Computer/Memory): 48K Apple II+/disk drive/monitor
Atari 800, TI 99/4A, IBM-PC
Grade Level: 5-8
Group Size: Individual or small group
Instructional Mode: Drill and practice, educational game
BSAP Objective: 5-2; 6-2; 7-2; 8-2

MATHEMATICS: GRADE ONE

1-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities and representations. These questions may require counting, using concrete objects, comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, establishing relationships between numerical quantities, identifying fractional quantities, estimating, determining place value, or creating or comparing sets.

1-2 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding or subtracting whole numbers.

1-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require telling time, naming days of the week or months of the year, identifying coins, estimating or measuring length or volume in nonstandard units or standard units (metric or customary).

1-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying or comparing geometric shapes.

1-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing a single mathematical operation with whole numbers or monetary amounts. Decision-making and alternative solution strategies may be required. Problems will focus on situations familar to students.

MATHEMATICS: GRADE TWO

2-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities and representations. These questions may require counting, using concrete objects, comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, establishing relationships between numerical quantities, identifying fractional quantities, estimating, determining place value, creating or comparing sets, or interpreting graphs.

2-2 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding, subtracting, or multiplying whole numbers.

2-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require telling time; naming dates, days of the week, or months of the year; identifying currency; estimating or measuring length, weight, volume, or temperature in nonstandard units or standard units (metric or customary).

2-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying or comparing geometric shapes; or identifying symmetrical divisions of geometric shapes.

2-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing a single mathematical operation with whole numbers or monetary amounts. Decision-making and alternative solution strategies may be required. Problems will focus on situations familiar to students.

MATHEMATICS: GRADE THREE

3-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities and representations. These questions may require counting, using concrete objects, comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, using a number line, establishing relationships between numerical quantities, identifying fractional quantities, estimating, determining place value, creating or comparing sets, or interpreting graphs.

3-2 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding, subtracting, multiplying, or dividing whole numbers, or adding or subtracting fractions.

3-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require telling time; naming dates, days of the week, or months of the year; identifying currency; selecting an appropriate measurement unit or measuring device; estimating or measuring length, weight, volume, or temperature in nonstandard units or standard units (metric or customary); or converting units within a measurement system.

3-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying or comparing geometric shapes; or identifying symmetrical divisions of geometric shapes.

3-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing one or more mathematical operations with whole numbers, fractions, or monetary amounts. Decision-making and alternative solution strategies may be required. Problems will focus on situations familiar to students.

4-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities and representations. These questions may require counting, comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, using a number line, establishing relationships between numerical quantities, estimating, determining place value, creating or comparing sets, or interpreting graphs.

4-2 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding, subtracting, multiplying, or dividing whole numbers; or adding or subtracting fractions, mixed numbers, or decimals.

4-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require telling clock or calendar time; selecting an appropriate measurement unit or measuring device; estimating or measuring length, weight, volume, or temperature in metric or customary units; converting units within a measurement system; or performing calculations with measured quantities.

4-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying or comparing geometric figures or identifying properties of geometric figures.

4-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing one or more mathematical operations with whole numbers, fractions, mixed numbers, or decimals. Decision-making and alternative solution strategies may be required. Problems will focus on situations familiar to students.

5-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities and representations. These questions may require counting, comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, using a number line, establishing relationships between numerical quantities, estimating, determining place value, creating or comparing sets, or interpreting graphs.

5-2 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding, subtracting, multiplying, or dividing whole numbers, fractions, mixed numbers, or decimals.

5-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require selecting an appropriate measurement unit or measuring device; estimating or measuring length, weight, volume, or temperature in metric or customary units; converting units within a measurement system; or performing calculations with measured quantities.

5-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying or comparing geometric figures; identifying properties of geometric figures; measuring line segments; or determining the perimeters or areas of geometric figures.

5-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing one or more mathematical operations with whole numbers, fractions, mixed numbers, decimals, or measurement units. The problems may also require applying a geometric formula or using information presented graphically. Decision-making and alternative solution strategies may be required. Problems will focus on situations familiar to students.

6-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities and representations. These questions may require counting, comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, using a number line, establishing relationships between numerical quantities, estimating, determining place value, creating or comparing sets, or interpreting graphs.

6-1 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding, subtracting, multiplying, or dividing whole numbers, fractions, mixed numbers, or decimals.

6-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require selecting an appropriate measurement unit or measuring device; estimating or measuring length, weight, volume, or temperature in metric or customary units; converting units within a measurement system; performing calculations with measured quantities; or interpreting scale drawings.

6-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying or comparing geometric figures; identifying properties of geometric figures; measuring line segments; or determining the perimeters or areas of geometric figures.

6-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing one or more mathematical operations with whole numbers, fractions, mixed numbers, decimals, or measurement units. The problems may also require applying a geometric formula or using information presented graphically. Decision-making and alternative solution strategies may be required. Problems will focus on situations familiar to students.

MATHEMATICS: GRADE SEVEN

7-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities and representations. These questions may require comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, establishing relationships between numerical quantities, estimating, determining place value, creating or comparing sets, using formulas, developing or interpreting graphs, using tables, or establishing ratios or proportions.

7-2 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding, subtracting, multiplying, or dividing whole numbers, signed numbers, fractions, mixed numbers, decimals, or percents.

7-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require selecting an appropriate measurement unit or measuring device; estimating or measuring length, weight, volume, or temperature in metric or customary units; converting units within a measurement system; performing calculations with measured quantities; or interpreting scale drawings.

7-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying or comparing geometric figures; identifying properties of geometric figures; or determining the perimeters, areas, or volumes of geometric figures.

7-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing one or more mathematical operations with whole numbers, fractions, mixed numbers, decimals, percents, or measurement units. The problems may also require applying a formula and/or using information presented graphically. Decision-making and alternative solution strategies may be required. Problems will focus on situations familiar to students.

MATHEMATICS: GRADE EIGHT

8-1 CONCEPTS

Objective: The student can apply numerical concepts.

Suggested Measurement Strategy: Answering questions about numerical quantities, and representations. These questions may require comprehending mathematical symbols and terminology, identifying equivalent ways of expressing the same numerical quantity, establishing relationships between numerical quantities, estimating, determining place value, creating or comparing sets, using formulas, developing or interpreting graphs, using tables, or establishing ratios or proportions.

8-2 OPERATIONS

Objective: The student can compute accurately.

Suggested Measurement Strategy: Determining the answers to exercises requiring a mathematical operation. The exercises to be solved may require adding, subtracting, multiplying, or dividing whole numbers, signed numbers, fractions, mixed numbers, decimals, or percents.

8-3 MEASUREMENT

Objective: The student can apply measurement concepts.

Suggested Measurement Strategy: Answering questions about measurement. These questions may require selecting an appropriate measurement unit or measuring device; estimating or measuring length, weight, volume, or temperature in metric or customary units; converting units within a measurement system; performing calculations with measured quantities; or interpreting scale drawings.

8-4 GEOMETRY

Objective: The student can apply geometric concepts.

Suggested Measurement Strategy: Answering questions about geometric representations. These questions may require identifying, comparing, or constructing geometric figures; identifying properties of geometric figures; or determining the perimeters, areas, or volumes of geometric figures.

8-5 PROBLEM SOLVING

Objective: The student can solve problems requiring the use of mathematics.

Suggested Measurement Strategy: Determining the solutions to verbal and nonverbal problems. These problems may require performing one or more mathematical operations with whole numbers, fractions, mixed numbers, decimals, percents, or measurement units. The problems may also require applying a formula and/or using information presented graphically. Decision-making and alternative solution strategies may be required. Problems will focus on situations familiar to students.

EVALUATION OF INSTRUCTIONAL SOFTWARE:
GUIDELINES FROM THE NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS
(Reprinted by permission)

1. INSTRUCTIONAL RANGE

For any given program, the appropriate grade level and ability must be judged according to the particular instructional setting. (A program that is informational at first grade might be remedial at third.) Key factors in determining grade or ability level are the concepts in the program. Other important factors are reading level, prerequisite skills, degree of student control, and intended instructional use. It is possible for a program to be flexible enough to be used across a wide range of grade levels and ability levels.

2. INSTRUCTIONAL GROUPING

The interaction between the learners and a program can be either direct or through an intermediary (the teacher). The first two groupings described below involve direct interaction; the third uses an intermediary.

Individual. Some programs are designed specifically for use by a single person. Programs of this nature may include a summary of individual performance; others may allow a specific level of difficulty - a specific set of spelling words, for example. Programs for individuals may have provisions for easier or more difficult situations, depending on the individual student's response.

Small group. Some programs are specifically designed for use with two, three, or four students. One such example might be an arithmetic fact game involving a car race in which each student can move forward on a correct answer. Other programs for smaller groups might be business simulations in which each small group is a business.

Large group. Large-group use of programs may vary in intent. A program may be used with a large group solely for the purpose of introducing the program for later use by individuals or small groups. Some programs are designed for use by a teacher in graphically demonstrating a concept. (Trigonometric functions provide one example: fraction concepts such as equivalence are another.)

3. EXECUTION TIME

The time required for the use of a program will vary considerably. The load time of the program depends on the complexity of the program and on whether it is being loaded from a cassette tape or a disk. (The disk is a much faster but more expensive storage medium.) The type of program is a factor (e.g., tutorial versus informational). The user will require additional time if responses are consistently incorrect. Another time factor is the degree of user control (i.e., how many options are available to the user). An estimate given as a range is an appropriate response for this item.

4. PROGRAM USES

The classification of programs by the instructional uses to which they are put is difficult. Careful analysis notwithstanding, definitions seem doomed to fuzziness, and a given program may seem to fit in more than one category. Moreover, the use of a given program can often be determined by the classroom practitioner; a program written with one use in mind may be used in completely different ways by each of several persons. In fact, a given person may identify more than one use for a program, leading to the necessity to indicate primary and secondary uses.

Despite the difficulties just noted, there is instructional value in attempting to identify the use or uses of a program. The following definitions are proffered as an aid to the classification of those program uses that appear on the check list. Additional uses are described later in this section.

Drill or practice: Programs that assume previous instruction in the concept, skill, or process to be addressed. They present a controlled sequence of exercises designed to drill the recall of certain pairings (e.g., to associate French verbs and their English counterparts or to recognize musical notes aurally) or to practice some algorithm (e.g., to add two four-digit whole numbers, to sort buttons on the basis of two or more criteria, or to assemble a telephone).

Tutorial: Programs through which the computer assumes total responsibility for instruction. Tutorial programs are characterized by a dialogue between the student and the computer in which the direction and level of the dialogue are shaped by student input. Ideally, such programs would be high fidelity simulations of the best teaching behavior associated with a given topic and would control the variables associated with the what, why, when, and who of the instructional episode.

Simulation: Programs that attempt to represent key aspects of some environment within which the user will experience the necessity to make decisions and will be informed of the results of those decisions without experiencing the real consequences of possible misjudgments. The time required to develop and use simulations with high fidelity is justified in situations where actual experience is ruled out because of extreme expense, safety considerations, or the time required for the actual experience. Simulations include problem-solving tasks (e.g., negotiation of a bank loan, diagnosis of illnesses or equipment failures, genetic experiments, testing theoretical models), procedural tasks (e.g., acidtitration, blasting, the breeding of organisms), and performances (e.g., control of water pollution).

Instructional gaming: Programs calling on the user to apply one or more specific skills or concepts in a game environment. The game dimension of the environment includes the conditions of competition with oneself or others, specific (if arbitrary) rules, the need to develop a winning strategy, and the introduction of random events to force the revision of strategies. This means that the primary objective of the exercise should be the development of general problem-solving skills. This objective is often accompanied by the objective of exercising specific concepts or skills in a new context. Examples of games that have been computerized include chess, Master Mind, and nim.

Problem solving: Programs serving either the student or the instructor; the problem to be investigated may be either within a given subject or within instruction in this subject. In practice, there are two levels of use - one that employs existing programs using known algorithms (e.g., the distance traveled by an object in free-fall during a given period of time) and one that requires the development of a program employing a user-defined algorithm (e.g., a program that finds the sum of distances from proposed locations of six warehouses to each of the establishments to be supplied by those warehouses). In fact, the development of the algorithm itself may be the object of the problem-solving activity.

Informational: Programs designed to generate information (lists of prime numbers, decimal approximations of rational numbers correct to any given number of decimal places, powers or roots of a given number, synonyms for any word from a given list, a list of formulas or rules, etc.). Although such programs might be employed to do problem solving or to construct a program in some other mode, the face value of the program remains that of data generation. They offer very little interaction with the person for whom the data is generated.

A blank at the end of item 4 of the checklist invites the user to specify other program uses. Another six possible program uses are suggested be low.

Demonstration: Programs that assume the intervention of an informed manager (teacher) between the program and the learner. They are designed to permit the manager to pursue the questions and suggestions of students by varying the conditions associated with some concept being developed. (For example, it might permit the variation of weather conditions in investigating their effects on annual production of selected crops.) These programs are generally devoid of textual display relative to their purpose and operation. This lack of text, while precluding direct use of the program by the learner, permits efficient realization of the program's purpose by an informed user (teacher). External documentation is critical to demonstration programs.

Instructional management: Programs designed to aid the user in the flexible and efficient management of such limited instructional resources as time, equipment, workspace, instructional personnel, and consumable materials. Such programs assume, at least in part, the tasks of making instructional diagnoses, giving course assignments, evaluating student progress, keeping student records, and facilitating communication among instructors and students.

Instructional support: Programs designed to facilitate the improvement of instructional products (e.g., worksheets, laboratory activities, newsletters, reports to students or parents), resource location (e.g., listings of publishers, suppliers, materials, or human resources), and product selection (e.g., textbook readability, software evaluation).

Test construction and analysis: Programs to aid in criterion-referenced testing or tailored testing. These programs offer such services as the banking of objectives or test items, item analysis, record-keeping, test generation, and test scoring.

Programming utility: Program building blocks that may be used to construct instructional programs. Their availability allows instructors or programmers to make efficient use of their hardware and their programming time. Examples of such building blocks would include programs that search a student's input for spelling, alphabetize lists, search lists for synonyms, create or delete data files, recall and display selected geometric figures, and translate typed input into spoken words.

Whistles and bells: Programs designed to acquaint the user with those characteristics of a computer system that may have instructional application. Such programs range from those that carefully demonstrate and explain a feature like screen protection (allowing sustained display of a chart or diagram without the possibility of student erasure or write over) to those that mindlessly exercise color and sound for the purpose of selling hardware.

5. USER ORIENTATION: INSTRUCTOR'S POINT OF VIEW

Flexibility. A program may permit the user or instructor to adjust it to accommodate a range of ability levels, several degrees of difficulty with respect to a given user, or the class of concepts involved. This can be accomplished through options presented by the program. For instance, a program dealing with the practice of whole number computation might offer a choice of the operation (addition, subtraction, multiplication, division) or the range of numbers involved (0-10, 0-20, 0-100). Another option might involve the difficulty of the problems presented in terms of the procedure required for a solution (i.e., borrowing versus no borrowing in the subtraction problems). Programs that do not offer such options to the student may have a provision for the execution of such adjustments by the teacher.

Intervention or assistance. Although it is a desirable goal for most programs to operate independently of the classroom teacher, there are programs for which assistance is needed and even desirable. For instance, some drill programs are "unending." Intervention to stop the program is done by the teacher and involves a judgment of what constitutes sufficient program use by a given student. (NOTE: A rating of "low" on "freedom from need to intervene or assist" would mean that considerable teacher intervention or assistance is required.)

6. USER ORIENTATION: STUDENT'S POINT OF VIEW

Quality of directions. Directions need to be concise and clear. They should be developed for the lowest level of use. Some directions can be simplified by the use of an example.

Quality of response. Responses to student input should be low-key and understandable. Responses to incorrect input should be neutral (e.g., "Incorrect. Try again." versus "Wrong, dummy! How could you get this far and know so little?").

Screening formatting. Formatting refers to the physical layout of text and graphics presented on the screen. Examples of poor formatting include a full screen of text with single spacing, too many graphics, continually flashing displays, and text scrolling off the screen. Some good examples

are centering of data, a few items on the screen with the user in control of when the next items appear, and reverse-field printing of key items (i.e., light print against a dark screen versus dark print against a light screen).

Need for external information. A program may require the user to have access to information other than that printed by it. Generally speaking, the more self-contained a program is, the better. However, certain programs intentionally require the use of external items. Examples of such programs include programs dealing with dictionary skills and the use of maps.

Disruption by system error. System errors result in the involuntary termination of a program. They may be introduced by improper calculations, errors in the logic of the program, or input that is conceptually correct but does not meet the form required by the program. Programs written to prevent all systems errors - syntactic errors and improper input - are the most desirable. They can be developed by using special input routines.

Simplicity of student input. A program should ensure that a user knows when and in what form input is needed. Characters with special meanings should be avoided. Input locations on the screen should be standardized throughout the program. Typing requirements should be minimal. If a special type of input is required, an example should be given.

7. CONTENT

Instructional focus and significance. The program's topic should be clearly defined. The instructional objectives of the program must be viewed as important by the instructor. Also, the program should represent a valid use of the computer's capabilities. (The program should not repeat the same set of questions or present problems in exactly one sequence.)

Validity and compatibility. The concepts and terms used should be correct, clear, and precise. The rate of presentation should be consistent with the levels for which the program is intended. The content, terminology, teaching style, and educational philosophy should be consistent with those generally encountered by the student.

8. MOTIVATION AND INSTRUCTIONAL STYLE

There are many options that may increase student motivation or develop a particular instructional style. Some of these options are a function of the hardware being used. Because these features are optional, a column labeled "none," meaning the feature is not present, has been added at the left of the low-high continuum.

Student involvement. The proper degree of involvement will vary with the type of program used. A drill or practice program for one student is highly active, whereas an information program may require little student input. Tutorial programs, being dialogues, should require student involvement.

Student control. Several concepts may be involved here. Options available to the student at the beginning of the program may include different kinds of content, levels of difficulty, or the type of response the student may wish to use. Additional examples of student control include the selection of the number of problems to be done and the provision of help (at the student's request) at any point in the program.

Game format. The use of a game format often generates favorable responses from students. Some examples are mathematics drill as a dragrace or in a tic-tac-toe or concentration format. Caution must be exercised so that the game format does not overshadow the instruction. Note that a game format does not imply that the program use is instructional gaming; a drill program may use a game format. A focus on problem-solving strategies is required for a program to be classified as having an instructional gaming use.

Graphics, animation, color. The functional use of one or more of these features can enhance instruction; their improper or irrelevant application can interfere or cause misconceptions. The uses of graphics, animation, or color must be examined carefully to ensure that they support concept development. One might begin that examination by asking what would be lost if the feature were deleted.

Voice and nonvoice audio. The use of voice input and output has considerable potential. Be aware that the quality and use of voice is dependent on the hardware. The use of nonvoice audio provides an additional means for attracting interest but may be distracting in the classroom.

Light pen. Some programs require the use of a light pen. This can be a good feature if a light pen is available, but a program employing a light pen will be useless without it.

Ancillary materials. Materials external to the program may be used. Some may be provided, but their use may not be required (e.g., pretests or posttests, worksheets, etc.). Others may be necessary but are locally available (e.g., dictionaries or local road maps). Care should be taken to note any materials developed especially for the program that must be supplied by the program's author or publisher.

As in item 4, a blank is left at the end of item 8. This is necessary because the list of special features grows daily; its length is a function both of the subject matter and the computer system involved. The listed features are in relatively common use; other examples include touch panels (the user can execute an instructional task simply by touching the screen with a finger), special keyboards for the physically handicapped, electronic devices that monitor a physical phenomenon (such as water temperture) and use it in the program's execution, and mechanical devices (robots, if you will) that interact with the program.

9. SOCIAL CHARACTERISTICS

Competition and cooperation. Some programs may be written for use by a single student, several students, or the whole class. Competition may be between two or more students or between a student and the computer; it

is generally motivating. The need for cooperation among students, also desirable, might be found in a business simulation that requires several students to operate the business.

Humanizing the computer. Programs may give the computer human characteristics. Some people find this desirable, whereas others wish to emphasize that the computer is a machine. Asking for the student's name may or may not be necessary or desirable. Older students generally find it boring, distracting, or phony.

Moral issues. Items or techniques that at first create interest may be questionable from other points of view. Capital punishment as exhibited by most hangman games is one example; war games are another.

Summary of student performance. A performance summary is a feature inherent to games that result in a winner. Performance on a simulation (e.g., the use of a credit card) also calls for a summary evaluation (e.g., the credit card was cancelled because of the inability to meet payments regularly). Drill programs often conclude with a summary regarding the speed of accuracy of the student's performance. Depending on the manner in which these summaries are presented, they may have either a positive or a negative effect on the learner.

NOTES ON THE DESIGN OR REDESIGN OF THE CHECKLIST

With the exception of the few descriptive requests at the top of the form and in items 1 through 4, the use of the checklist requires only making checks, circling words, or bracketing ranges of dots on judgement scales. The design of the scales in items 5 through 9 was with an eye to consistency; it also consistently expresses the summary prejudices of the writers. For each scale, a rating toward the left-most extreme (identified by such terms as "low," "passive," and "poor") would generally be, for the writers, a negative evaluation of the software. (This technique isn't foolproof. A rating of "low" on "freedom from need for external information" might be desirable for a drill program but is probably neither desirable nor possible with a simulation.) That is, the writers felt that a program should rank high in flexibility, should call for active student involvement, should make good use (if any) of color, and should employ competition in a positive way only. This left-is-negative and right-is-positive arrangement of the scales allows one to get the general sense of an evaluation by scanning the completed checklist. When items are added are altered on the checklist, it would be a good idea to keep this design intact. Thus, should you feel that program control should be within the program itself, you might reword the second part of item 8 to read as follows:

```
low                                   high
 *       *       *       *       *    freedom from student control
```

as rewritten, the word low would continue to be associated with an undesirable characteristic.

SOFTWARE EVALUATION CHECKLIST

PROGRAM NAME: _____ SOURCE: _____ COST: _____

SUBJECT AREA: _____ *REVIEWER'S NAME:* _____ DATE: _____

1. INSTRUCTIONAL RANGE

_____ grade level(s)

_____ ability level(s)

2. INSTRUCTIONAL GROUPING FOR PROGRAM USE

_____ individual

_____ small group (size: _____)

_____ large group (size: _____)

3. EXECUTION TIME

_____ minutes (estimated) for average use

4. PROGRAM USE(S)

_____ drill or practice

_____ tutorial

_____ simulation

_____ instructional gaming

_____ problem solving

_____ informational

_____ other (_____)

5. USER ORIENTATION: INSTRUCTOR'S POINT OF VIEW

low				*high*	
•	•	•	•	•	flexibility
•	•	•	•	•	freedom from need to intervene or assist

6. USER ORIENTATION: STUDENT'S POINT OF VIEW

low				*high*	
•	•	•	•	•	quality of directions (clarity)
•	•	•	•	•	quality of output (content and tone)
•	•	•	•	•	quality of screen formatting
•	•	•	•	•	freedom from need for external information
•	•	•	•	•	freedom from disruption by system errors
•	•	•	•	•	simplicity of user input

7 CONTENT

low				*high*	
•	•	•	•	•	instructional focus
•	•	•	•	•	instructional significance
•	•	•	•	•	soundness or validity
•	•	•	•	•	compatibility with other materials used

8. MOTIVATION AND INSTRUCTIONAL STYLE

passive				*active*	
•	•	•	•	•	type of student involvement

low				*high*	
•	•	•	•	•	degree of student control

none	*poor*				*good*	
•	•	•	•	•	•	use of game format
•	•	•	•	•	•	use of still graphics
•	•	•	•	•	•	use of animation
•	•	•	•	•	•	use of color
•	•	•	•	•	•	use of voice input and output
•	•	•	•	•	•	use of nonvoice audio
•	•	•	•	•	•	use of light pen
•	•	•	•	•	•	use of ancillary materials
•	•	•	•	•	•	use of _____

9. SOCIAL CHARACTERISTICS

present and negative	*not present*	*present and positive*	
_____	_____	_____	competition
_____	_____	_____	cooperation
_____	_____	_____	humanizing of computer
_____	_____	_____	moral issues or value judgments
_____	_____	_____	summary of student performance

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1. The grade levels and ability levels for a particular program are primarily determined by the concepts involved. Other important factors are reading level, prerequisite skills, degree of student control, and intended instructional use. It is possible for a program to be flexible enough to be used across a wide range of grade levels and ability levels.

2. Some programs are designed for use by individuals. Others have been or can be modified for participation by two or three persons at a time. Simulations or demonstrations often pose opportunities for large-group interaction. A given program may be used in more than one grouping, depending on the instructor.

3. The time required for the use of a program will vary considerably. Include loading time for cassettes. A time range is the appropriate response here.

4. Instructional programs can be categorized according to their uses. Some programs may have more than one use, thus falling into more than one of the following categories:

Drill or practice: Assumes that the concept or skill has been taught previously.

Tutorial: Directs the full cycle of the instructional process; a dialogue between the student and the computer.

Simulation: Models selected, alterable aspects of an environment.

Instructional gaming: Involves random events and the pursuit of a winning strategy.

Problem solving: Uses general algorithms common to one or more problems.

Informational: Generates information (data).

5. These are factors relevant to the actual use of the program from the point of view of an instructor.

Flexibility: A program may allow the user or the instructor to adjust the program to different ability levels, degrees of difficulty, or concepts.

Intervention or assistance: A rating of "low" means considerable teacher intervention or assistance is required.

6. These are factors relevant to the actual use of the program from the point of view of a student.

Directions: The directions should be complete, readable, under the user's control (e.g., should not scroll off the screen until understood), and use appropriate examples.

Output: Program responses should be readable, understandable, and complete. If in response to student input, the output should be of an acceptable tone and consistent with the input request.

Screen formatting: The formats during a program run should not be distracting or cluttered. Labels and symbols should be meaningful within the given context.

External information: A program may require the user to have access to information other than that provided within it. This may include prerequisite content knowledge or knowledge of conventions used by the program designer as well as maps, books, models, and so on.

System errors: System errors result in the involuntary termination of the program.

Input: A program should ensure that a user knows when and in what form input is needed. It should avoid using characters with special meanings, restrict input locations to particular screen areas, and require minimal typing.

7. These are matters relevant to the subject-matter content of the program.

Focus: The program topic should be clearly defined and of a scope that permits thorough treatment.

Significance: The instructional objectives of the program must be viewed as important by the instructor. Also, the program should represent a valid use of the computer's capabilities while improving the instructional process.

Soundness or validity: The concepts and terms employed should be correct, clear, and precise. Other important factors are the rate of presentation, degree of difficulty, and internal consistency.

Compatibility: The content, terminology, teaching style, and educational philosophy of the program should be consistent with those generally encountered by the student.

9. Competition, cooperation, and values are concerns that may be a function of the way a program expresses them. (War gaming and the "hangman" format are sample issues.) Also, the "humanizing" of the computer may serve for motivation or to reduce anxiety, but it also may become tedious, misleading, and counter-productive.

The summary of student performance can be dichotomous (win or lose), statistical (time expended or percent of items correct), or subjective (as in the evaluation of a simulation). It may be for student, teacher, or both.

PRODUCERS	SOFTWARE TITLES
ADDISON-WESLEY PUBLISHING COMPANY Sand Hill Road Menlo Park, CA 94025	Computer Math Activities, Volumes I - V Computer Math Games, Vol. I
APPLE COMPUTER, INC. 20525 Mariani Avenue Cupertino, CA 95014	LOGO
ATARI PROGAM EXCHANGE P. O. Box 427 155 Moffett Park Drive Sunnyvale, CA 94086	Mathematic-Tac-Toe LOGO Cubbyholes
C & C SOFTWARE 5713 Kentford Circle Wichita, KS 67220	Learning About Numbers
COMMODORE BUSINESS MACHINES, INC. 1200 Wilson Drive West Chester, PA 19380	LOGO
COMPU-TATIONS, INC. P. O. Box 502 Troy, MI 48099	Soccer Math
CONTROL DATA PUBLISHING COMPANY P. O. Box 261127 San Diego, CA 92126	Whole Numbers Practice (PLATO) Fractions Practice (PLATO)
COUNTERPOINT SOFTWARE, INC. Suite 218 4005 West 65th Street Minneapolis, MN 55423	Early Games
DEVELOPMENTAL LEARNING MATERIAL 1 DLM Park Allen, Texas 75002	Arcademic Skill Builders Alien Addition Minus Mission Dragon Mix Meteor Multiplication Demolition Division Alligator Mix
EDUCATIONAL ACTIVITIES P. O. Box 392 Freeport, NY 11520	Long Division
EDU-SOFT Box 2560 Berkeley, CA 94702	Intergers

FOLLETT LIBRARY BOOK COMPANY 4506 Northwest Highway Crystal Lake, IL 60014	Bumble Plot
HARTLEY COURSEWARE, INC. P. O. Box 431 Dimondale, MI 48821	Prescriptive Math Drill Clock Money! Money! Expanded Notation Number Words - Level 1 Number Words - Level 2
HARVARD ASSOCIATES 200 Beacon Street Sommerville, MASS 02143	LOGO
KRELL SOFTWARE 1320 Stony Brook Road	LOGO Stony Brook, NY 11790
LEARNING COMPANY, THE 4370 Alpine Road Portola Valley, CA 94025	Moptown Parage Gertrude's Secrets Gertrude's Puzzles Bumble Plot Bumble Games
McGRAW HILL 1221 Avenues of the Americas New York, NY 10020	Math Word Games
MATH CITY 4040 Palos Verdes Drive, North Rolling Hills Estates, CA 90274	Mathware, Basic Math - System S
MENTOR SYSTEMS, INC. 962 Deleware Avenue Lexington, KY 40505	Basic Math Skill Game
MILLIKEN PUBLISHING COMPANY 1100 Research Boulevard St. Louis, MO 63132	Golf Classic/Compubar Math Sequences
MILTON BRADLEY COMPANY 443 Shaker Road East Longmeadow, MA 01028	Division Skills Decimal Skills Mixed Numbers Mathematical Concepts
MINNESOTA EDUCATIONAL COMPUTING CONSORTIUM PUBLICATIONS (MECCA) 2520 Broadway Drive St. Paul, MN 55113	Bagels Sell Lemonade Taxman Adventures With Fractions Early Addition Growgins' Fractions Problem Solving Strategies

QUALITY EDUCATIONAL DESIGN 2924 N. E. Stanton/P. O. Box 12486 Portland, OR 97212	Fractions Arith-Magic Factoring Whole Numbers
RADIO SHACK EDUCATION DIVISION 1600 Tandy Center Ft. Worth, TX 76102	Computer Programs In A Series
RANDOM HOUSE SCHOOL DIVISION 2970 Brandywine Road Atlanta, GA 30341	Galaxy Math Facts Game
SCOTT, FORESMAN & COMPANY 1900 East Lake Avenue Glenview, IL 60025	Addition and Subtraction, 1 & 2 Multiplication I Division I
SCIENCE RESEARCH ASSOCIATES, INC. (SRA) 5060 Riverhill Road Marietta, GA 30067	Arithmetic Games Computer Drill & Instruction: Math Fast Track Classroom Management System: Math, Level B
STERLING SWIFT PUBLICATIONS 7901 South I-35 Austin, TX 78744	Elementary Math Classroom Learning System The Arithmetic Classroom
SUNBURST COMMUNICATIONS 39 Washington Avenue Pleasantville, NY 10570	Teasers By Tobbs Explorer Metros: A Metric Adventure Challenge Math Survival Math The Factory Color Keys: Strategies In Problem Solving
SOCIETY FOR VISUAL EDUCATION (SVE) 1345 Diversey Parkway Chicago, IL 60614	Guinness World Records Problem Areas In Math
TERRAPIN, INC. 380 Green Street Cambridge, MASS 02139	LOGO
TEXAS INSTRUMENT P. O. Box 53 Lubbock, TX 79408	LOGO
TOTAL INFO EDUCATIONAL SYSTEM (TIES) Minnesota School Districts Data Processing Joint Board 1925 West County Road B2 St. Paul, Minn. 55113	Super Drill and Super Teacher
XEROX EDUCATIONAL PUBLICATIONS Computer Software Division Middletown, CT 06457	Stickybear Numbers